

## Claims

- [1] A manipulation device of a microwave oven, comprising:
  - a control panel;
  - a dial knob stably mounted on the control panel, the dial knob including a coupling shaft formed at a center portion with a predetermined length and at least one guide rib formed on an outer surface of the coupling shaft; and
  - an output adjusting gear coupled with the dial knob.
- [2] The manipulation device according to claim 1, wherein the control panel comprises a recessed portion on which the dial knob is mounted.
- [3] The manipulation device according to claim 1, wherein the control panel comprises a knob hole at a predetermined location in which the dial knob is inserted for the stable mounting.
- [4] The manipulation device according to claim 3, wherein the control panel further comprises a stop projection protruded from a circumference of the knob hole toward a center of the knob hole to restrict a movement of the dial knob within a predetermined range.
- [5] The manipulation device according to claim 1, wherein a coupling member is inserted at an end of the coupling shaft to fix the output adjusting gear to the dial knob.
- [6] The manipulation device according to claim 1, wherein the coupling shaft comprises a hole at a leading end with a predetermined depth, for receiving a coupling member.
- [7] The manipulation device according to claim 1, wherein the guide rib comprises a coupling tab protruded from a leading end with a predetermined width and height.
- [8] The manipulation device according to claim 1, wherein the guide rib comprises a reinforcement rib formed at one side with a predetermined width and length.
- [9] A manipulation device of a microwave oven, comprising:
  - a dial knob;
  - a coupling shaft extending from a center of the dial knob with a predetermined length;
  - an output adjusting gear having a shaft hole in which the coupling shaft is inserted;
  - a control panel in which the dial knob is rotatably inserted; and
  - a coupling member fixing the output adjusting gear to the dial knob, for an integral rotation of the output adjusting gear with the dial knob.
- [10] The manipulation device according to claim 9, wherein the output adjusting gear

- comprises a tab slot extending from a circumference of the shaft hole with a predetermined length.
- [11] The manipulation device according to claim 9, wherein the output adjusting gear comprises a guide surface for preventing an engaged gear from separating from the output adjusting gear.
- [12] The manipulation device according to claim 9, wherein the output adjusting gear comprises a guide surface on a back, an outer diameter of the guide surface being larger than an outer diameter of gear teeth of the output adjusting gear.
- [13] The manipulation device according to claim 9, wherein the coupling member is a screw of which outer surface is threaded.
- [14] The manipulation device according to claim 9, wherein the output adjusting gear comprises a gear sleeve formed at a back with a predetermined diameter and height.
- [15] The manipulation device according to claim 9, wherein the control panel comprises:  
a mounting surface at one side on which the dial knob is stably mounted; and  
a receiving sleeve formed on the other side with a predetermined diameter and height to stably receive the output adjusting gear.
- [16] The manipulation device according to claim 9, wherein the output adjusting gear comprises at least one slot extending radially from a circumference of the shaft hole with a predetermined length and width.
- [17] The manipulation device according to claim 9, wherein the output adjusting gear comprises at least one slot in which a rib formed on the coupling shaft is inserted, such that the dial knob is rotated integrally with the output adjusting gear without slip.
- [18] A manipulation device of a microwave oven, comprising:  
a dial knob;  
an output adjusting gear coupled with the dial knob for transmitting the rotation motion of the dial knob;  
a control panel having a knob hole in which the dial knob is rotatably inserted and a stop projection extending from a circumference of the knob hole toward a center of the knob hole; and  
a coupling member for the coupling of the dial knob and the output adjusting gear.
- [19] The manipulation device of claim 18, wherein rotational range of the dial knob inserted in the knob hole is determined by a width of the stop projection.
- [20] The manipulation device of claim 18, wherein the output adjusting gear comprises a guide surface on a side to prevent an engaged gear from separating

from the output adjusting gear.